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REMARKS

The Examiner's indication of allowable subject matter of claims 2, 4, 6, and 8-11 is noted with appreciation.

Claims 1-12 are pending in the application. Claim 1 has been amended to better define the claimed invention over the applied art of record. Claims 1-11 have also been amended to improve claim language. Claim 12 has been added to provide Applicants with the protection to which they are deemed entitled. The "Summary of the Invention" section of the specification has been revised to be commensurate in scope with amended claim 1. A new Abstract in conformance with US practice has been submitted. No new matter has been introduced through the foregoing amendments.

Claims 2, 4, 6, and 8-11 stand allowed as indicated in paragraphs 6-7 of the Office Action.

The 35 U.S.C. 102 rejections of claims 1, 3, 5, and 7 as being anticipated by Yoshinaga (US 2002/0193212) and Tochigi et al. (US 2001/0040129 A1) are noted. Independent claim 1 has been amended to specifically define the claimed invention over the applied references. In particular, amended claim 1 now recites, among other things, the steps of **"moving the welder from the welded portions to a predetermined position while maintaining contact between the welder and the first piston member after finishing the friction stir welding, and separating the welder from the first piston member at said predetermined position."**

It should be noted that, in the prior art, such as US Patent No. 5,460,317 and Japanese patent laid-open publication No. Hei 11-156560 mentioned in the specification, a disadvantage exists in that it is impossible to form a coating film of a uniform thickness during a coating process after the process of friction stir welding, resulting in reduced durability of the welded portion, because a hole is inevitably formed in the welded portion between the piston members when the welder is separated from the welded portion of the piston members. Note new claim 12 which requires that no hole be formed in the welded portions of the first and second piston members.

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However, in the invention of amended claim 1, the disadvantage of the prior art can be overcome by moving the welder from the welded portions to a predetermined position while maintaining contact between the welder and the first piston member, and then separating the welder from the first piston member at said predetermined position. Thus, although a residual specked hole might be formed where the welder is separated from the piston member(s), the hole is moved outside the welded portion, to another, predetermined position in an area that is not to be coated. As a result, a uniform coating film can be formed afterward. The area that is not to be coated, in an embodiment claimed in claim 7, is the bridge of the first piston member.

None of the applied references fairly teach or suggest the highlighted feature of the invention defined in amended claim 1.

Specifically, with respect to Yoshinaga, the Examiner states that the reference teaches a method of manufacturing a cylindrical member comprising a hollow section by rotatably supporting first and second members, temporarily coupling the members and then friction stir welding at the interface. The examiner further states that the Yoshinaga friction stir member and supports are moveable.

Applicants respectfully submit that the Yoshinaga reference does not teach or suggest the highlighted feature of amended claim 1. The reference teaches, at best, a compound machining device including multiple linear moving and rotary axes. See Yoshinaga at FIG. 1. However, the reference does not teach or suggest the claimed step of moving the welder from the welded portions after finishing the friction stir welding. Accordingly, amended claim 1 is patentable over Yoshinaga.

With respect to Tochigi et al., the Examiner states that the reference teaches a method of manufacturing a cylindrical member comprising a hollow section by rotatably supporting first and second members, temporarily coupling the members and then friction stir welding at the interface. The examiner further states that the Tochigi et al. friction stir member and supports are moveable.

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Applicants respectfully submit that the Tochigi et al. reference does not disclose the highlighted feature of amended claim 1. Applicants have carefully reviewed the applied reference, including the portions cited by the Examiner (FIG. 1 and paragraphs 11-13, 23) as well as other relevant portions (e.g., paragraphs 59-62 and Figs. 8 and 9), but are unable to locate any disclosure of the above highlighted claim feature. The reference clearly fails to disclose the claimed step of moving the welder from the welded portions after finishing the friction stir welding. Accordingly, amended claim 1 is patentable over Tochigi et al.

Claims 3, 5, 7 and new claim 12 depend from independent claim 1 and are patentable over the applied references at least for the reasons advanced with respect to amended claim 1.

Each of the Examiner's rejections has been traversed/overcome. Accordingly, Applicants respectfully submit that all claims are now in condition for allowance. Early and favorable indication of allowance is courteously solicited.


The Examiner is invited to telephone the undersigned, Applicant's attorney of record, to facilitate advancement of the present application.

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To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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